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Journal of the Society of Arts.

FRIDAY, OCTOBER 17, 1862.

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INTERNATIONAL EXHIBITION OF 1862.

REPORTS OF THE JURIES.

The Council of the Society of Arts have felt the importance of having some permanent and authoritative Record of the International Exhibition, and finding that Her Majesty's Commissioners have provided only for the publication of the awards of the Juries, but not of their Reports descriptive of the Progress of Industry since the Exhibition of 1851, the Council have undertaken this work, with the co-operation of Her Majesty's Commissioners and of the Juries, and have placed the matter in charge of Dr. Lyon Playfair, the Special Commissioner of the Juries.

The Reports will be published in super royal octavo, to range with the one-volume Jury Reports of 1851. The price of the volume, bound in cloth, to Members of the Society of Arts, to Jurors, and Guarantors, is fixed at 10s.; to other persons, 15s. If bound in morocco, 7s. 6d. additional in each case.

Forms of application for copies have been issued to Members of the Society, to Jurors, and to Guarantors.

It was the intention of the Council to issue the volume complete in the early part of September, but as several of the Reports have not yet been received by Her Majesty's Commissioners, the completion of the entire work has been unexpectedly delayed; the Council, however, unwilling to defer the publication of the Reports already completed, have issued to the subscribers those that have been received up to the present time. When all the Reports are delivered, the parts now issued to subscribers will be exchanged, if uninjured, for the perfect volume, bound or unbound, as desired. Individual reports are sold separately; for prices see advertisement.

INTERNATIONAL EXHIBITION OF 1862.—Visits of Schools.

The following is a continuation of the Schools reported to Her Majesty's Commissioners as having entered the Building from the 6th to the 9th of October:—

Date.	From what Locality.	Name of School.	By whom Sent.	No. of Children from each School.	Total each day.
Oct. 6	Canterbury	Cathedral Choristers	The Dean	23	
,, ,,	Oxford	Blue Coat	Subscription	63	
,, ,,	City of Oxford	Nixon's	Subscription	77	163
,, 7	Islington	Holy Trinity	Subscription	35	
,, ,,	Chislehurst	National	Rev. F. Murray	26	
,, ,,	Paddington	St. John's (Servants)	Subscription	21	
,, ,,	Paddington	St. Stephen's	Rev. W. A. Newton	7	
,, ,,	London	St. Dunstan's-in-the-West	H. Southgate	50	
,, ,,	Foot's Cray, Kent	National	Subscription	40	
,, ,,	Manchester	Trafford Mount	Dr. J. W. Hudson, F.S.A.	14	
,, ,,	Harrow Weald	Parochial	Subscription	44	237
,, 8	Brighton	All Souls'	Subscription	15	
,, ,,	Godstone	Sunday and National	Subscription	71	
,, ,,	Peckham	Collegiate	Rev. Thos. Ray	21	
,, ,,	Brook-street	Refuge	Committee	18	
,, ,,	Brixton-hill	British	Committee	26	
,, ,,	Carshalton, Surrey	British	S. Gurney, Esq.	64	215
,, 9	Southwark	King Edward's	The Governors	25	
,, ,,	Southwark	St. Saviour's	Subscription	126	
,, ,,	South Mimms	National	W. Ramsden Price, Esq.	26	
,, ,,	Lymington & Baldre	National and Sunday	Lord G. Lennox and Mr. Mackinnon	313	
,, ,,	Upper Norwood	National	Anonymous	180	
,, ,,	Clapton	St. James's College	The Warden	13	
,, ,,	Stepney	Trinity Church Choir	Rev. F. S. Lea	16	
,, ,,	St. Marylebone	Trinity Choir	J. Alexander, Esq.	12	
,, ,,	St. Martin's, Westminster	Sunday	Friends	37	
,, ,,	Harp-alley, Farringdon-street	British	Subscription	12	
,, ,,	Streatham	Christ Church	Rev. W. Raven	30	
,, ,,	Upper Tooting	Holy Trinity	Rev. F. Borradale	20	
,, ,,	Hastings	St. Mary's, Sunday	Miss Mirlees	138	
	Hillingdon	National	Rev. Richard Croft	90	
,, ,,	Wells-street	St. Andrew's Choristers	Lord Dillon	15	1,053

Visits of Workmen.

The following is a continuation of the return of the number of workmen, mechanics, operatives, and others who have visited the building from the 6th to the 11th of October :—

Date.		Description of Persons.	From what Locality.	By whom Sent.	Number.
Oct.	6	Tailors	17, Old Bond-street	Messrs. Doudney and Sons	45
,,	,,	Men of the 91st Regiment	Chatham	Colonel Patterson, Capt. D'Eye,&Lieut.Armstrong	45
,,	,,	Agricultural Labourers	Milton, near Canterbury	R. Lake, Esq.	55
,,	,,	Agricultural Labourers	Stanton Wyvell,Leicestershire	Rev. T. Burnaby	15
,,	,,	Mechanics	Millwall	Burney and Bellamy	61
,,	,,	Printers	Cursitor-st., Chancery-lane	Mr. Trounce	17
,,	,,	Men of the 83rd Regiment	Dover	The Officers	152
,,	7	Maltsters	Aylesworth	Mr. Burleigh	20
,,	,,	Agricultural Labourers	Searls Fletching, Sussex	Sir Thos. Wilson, Bart.	37
,,	,,	Labourers	Southam, Warwickshire	Subscription	65
,,	,,	Agricultural Labourers	Banbury, Oxon	E. Wilson, Esq.	30
,,	,,	Agricultural Labourers	Overstone	Mr. Owen Wallis	16
,,	8	Seamen of H.M.S. *Cornwallis*.	Hull	Capt. Grenfell	12
,,	,,	Estate Labourers	Stratton-park, Hants.	Sir G. Baring.	36
,,	,,	Mechanics and Labourers	Woolhampton, Berks	Jas. Blyth, Esq.	60
,,	9	Boys of H.M.S. *Fisguard*	Woolwich	Commander Lysett	60
,,	11	Builders' Workmen	Camden Town	Mr. Samuel Walton	40

PRODUCTS OF INDIA.

The following notes are extracted from the official Catalogue of the contributions from India to the International Exhibition of 1862.

Starches.

Arrowroot, both wild and cultivated, grows remarkably well in the district of Cuttack. It is not easy to decide whether the wild is identical with our garden arrowroot. A cup of arrowroot made of the one is not distinguishable from a cup made of the other, except, perhaps, by a slightly earthy taste and smell observable in the wild arrowroot, which is easily accounted for by its imperfect manufacture. The cultivation and more perfect manufacture of the garden arrowroot have been comparatively recently introduced into the province, so that it is neither generally grown nor its produce used by the natives. A specimen has been sent to the Exhibition, made from plant of his own growing, by a native Christian of "Khundittur," who sells his produce among the European residents of Cuttack, his price being a little under 6d. per English lb. This arrowroot is of excellent quality, and the process of manufacture as simple as may be. The tubers are taken up in the cold season, washed, put into a large wooden mortar, and mashed. The mash is then taken out, and well washed in cold water, the water drained off, and set to stand in large flat vessels, in which it deposits a large proportion of the arrowroot flower, which is re-washed in cold water, and set to dry in the sun. The wild arrowroot, known in the bazaar as "Paloua," is a plant growing abundantly in the jungles of the district. It is collected in the cold season by the Sahars, the tubers pounded and mashed, and the sediment dried in the sun. By these people it is eaten and sold for the manufacture of what is called "Abheer." In the Sumbulpore, and to a less degree, also in the Cuttack district, the wild arrowroot is made into cakes, or boiled with milk, and thus used as an article of food.

Starch made from the wild ginger grows everywhere in the Chittagong district; it is very difficult to eradicate it from land, as the smallest root or piece of a root has an eye, and will spring up again. The plant dies off in December. A rough experiment was made with this root by the Civil Assistant-Surgeon of that place, Dr. W. B. Beatson, and the yield was estimated at one ounce of starch from one pound of the root. The experiment, however, was not precise enough to be satisfactory, and he is inclined to think that the yield would be much larger, as the microscope shows the root to be loaded with starch granules. The supply of the root being inexhaustible, any quantity of starch might be extracted from it yearly, and it might be found a valuable article of commerce; there would be no expense of cultivation, and allowing for the cost of digging the root, and manufacturing the starch by bruising and macerating the root in water and drying the deposit, the product would be cheaper than Arracan rice, which is believed to be largely exported to Europe to be used, not as food, but in manufacture for glazing linen, &c.

A substance called Behchandee, if pulverized, resembles arrowroot, and is made use of by natives on fast days, prepared in various ways. It is obtained from the glutinous matter which issues from the stems of a jungle plant, after being soaked in running water for some days. The Gonds prepare the Behchandee. It can be had in any quantity in the Jubbulpore bazaar, but most of it comes from Mundla and Seonee.

Resins and Gum Resins.

"*Khair*" as locally called, the kut or cutch of commerce, catechu—exploded name Terr Japonica, is produced in Cuttack. This is the inspissated juice of the *Mimosa Catechu* (Linn.), known locally as the "*Khair*" tree. The tree is common throughout the jungle tracts of this division. The *modus operandi* of its extraction is as follows :—A tree, being felled, is barked and branched, and the sound wood cut into logs and split into pieces of the proper size. These are then placed in large earthen pots, filled with water, on the fire, and thoroughly boiled. The liquid thus impregnated with the resin or juice is then drained off into smaller pots, which are frequently replenished, and the process of boiling continued, till the water is evaporated, and the *residuum*, a thick cake of "*Kut*," is then removed, or the resin in a semi-liquid state is turned out into leaves pinned together in the shape of cups or moulds, and then left to drain and harden. A small portion only of this produce is locally consumed, the rest exported. Here it is principally used with "pân," in solution as a lotion for suppurating wounds, and by the dyer. The local retail price in the bazaar is 15s. for the maund of 100 lbs. English.

It is also obtained from the *Acacia Catechu*, of which tree there are vast numbers all over Pegu and Burmah. This is one of the staple exports of Pegu: the value of Cutch exported in the year 1860-61 being £72,000. Price—Rs. 20 for 365 lbs.

Sakhoo, *Shorea Robusta*, is produced in Lucknow. It grows spontaneously in the Taraee. It is a kind of resin which exudes from the above tree; natives boil it with linseed oil and use it instead of tar, called *Dhoona* or *ral*, and also for varnishing. 3½ seers per Rupee.

Resin, locally called " *Jhoona*," " *Dhoona*," is found in Cuttack. This is apparently a resinous gum, which is obtained from the *Shorea Robusta*, one of the most abundant forest trees in the jungles. It is procured by making incisions in the stem of the tree, from which the resin exudes, and is collected. The local retail price is about 3 annas, that is 4½d. per seer of 2½ pounds weight.

Ing Doay wood, resinous, is a hard substance used for caulking boats.

Sooparee or Goa, the Goobak of the Sungscreet classics, is the nut of the *Areca catechu*. This graceful tree is cultivated to any extent only in the Pooree district. The nut is used in this province almost exclusively in conjunction with other ingredients, with the leaf of the " Piper Betel," forming together the well-known masticatory of the East " *Pan*." Locally at Cuttack the best nuts are retailed at about 2 annas per English lb. weight. The tree is grown in company with the cocoanut in plantations in moist situations, and, like the cocoanut, is productive and valuable. The cultivation of both trees, but more especially the cocoanut, was, up to a recent date, almost entirely in the hands of a class of Sasum Brahmins, who were enabled so long to maintain the monopoly by the aid of a superstitious belief that a fatality attached to the planting of these trees by any one not a Brahmin. An astringent extract is also obtained from old areca nuts, which is used in dyeing processes.

Naphtha, locally called Benansee, is produced in Ramree, Akyab, Leydoung Circle. It is used as varnish for oiling boats, posts, &c. There are two wells; they each produce about 14 maunds per annum. No great increase is expected. The naphtha is clear and bright, and none is exported. Price—from 6 to 7 Rupees per maund of 80 lbs.

Stick Lac is found in large quantities in the jungles of Chota Nagpore.

Thettee Varnish, the celebrated Burmese black varnish, is obtained from *Melanorrhœa usitatissimum*. In varnishing an article the Burmese first give it a coat of an inferior quality; when this is dry, they lay a coat of a superior quality over it, and finish with a coat of the best over all. Price—Rs. 120 for 1st quality; Rs. 80 for 2nd, and Rs. 60 for 3rd quality, for 365 lbs.

Wood oil, called Kee eintsee, produced in Kaladyne, in Akyab district, is used for burning and varnishing; 100 maunds or more procurable. Not exported: used in the province. Price—from 5 to 7 Rupees per maund.

Gums.

Babool is an inferior kind of Gum Arabic, which the natives called *Joud*; it exudes from the tree *Acacia Arabica*: 4 seers for the Rupee.

Gum Kino, the gum of either *Pterocarpus Indicus*, or *Pterocarpus Wallichii*, is found in the Rangoon. It is one of the most abundant of the forest trees. Any quantity of Gum Kino might be exported, but the demand is at present limited. Price—Rs. 5 per 365 lbs.

The bark of the buglar tree is used as glue for joining woods.

Caoutchouc is a new production, collected and prepared from the various plants of the district of Goruckpore.

Tobacco.

Tobacco is cultivated in the province of Moulmein, and is much used by the natives, but not exported.

The tobacco grown in the province of Burmah is inferior, though the soil is well suited to the finer kinds; yet though seed has been largely distributed, and many efforts made to improve the cultivation, the Burmese continue wedded to their old ways. Price 35 to 40 Rupees per 365 lbs.

The tobacco grown in the district of Cuttack it is feared has very much deteriorated through careless and negligent culture. The dry leaf is barely smokeable by any one not a native, almost on account of the imperfect manner in which it has been cured. Such as it is, it is grown for local consumption pretty generally on what is called " Pattoo " soil, a rich, black, clayish deposit found on the banks and in the beds of rivers. The Ooryahs are great smokers. The wholesale price of the first quality ranges from 6 Rupees or 12s. to 8 Rupees or 16s. the 100 couple.

Tobacco is much used for smoking in Kaladine; 5,000 maunds produced, but might be increased, if required. Price—25 Rupees per maund.

20,000 maunds are procurable in the district of Sandoway. The country and soil will not admit of any material increase of cultivation. For some years Messrs. Mohr, Brothers, and Co. exported Sandoway tabacco to Europe, but for the last two years none has been exported thither. The bulk of the crop is consumed by the Mugs in this province, in the shape of cigars, in smoking, and some 2,000 maunds are taken to Calcutta and Chandernagore, and are there manufactured into cigars. Price—12 Rupees per maund.

Wool.

The following woollen substances are used in the Punjab:—

(1). *Pashum*, or shawl wool, properly so called, being a downy substance, found next the skin and below the thick hair of the Thibetan goat. It is of three colours; white, drab, and dark lavender (Tûsha).

The best kind is produced in the Semi-Chinese Provinces of Turfan Kichar, and exported *via* Yarkand to Kashmere. All the finest shawls are made of this wool, but as the Maharajah of Kashmere keeps a strict monopoly of the article, the Punjub shawl weavers cannot procure it, and have to be content with an inferior kind of Pashum produced at Châthân, and exported *via* Leth to Umritsur, Nûrpur, Loodianah, Jelapûr, and other shawl-weaving towns of the Punjab. The price of white Pashum in Kashmere is, for uncleaned, 3 to 4s. per lb., ditto cleaned, 6 to 7s. per lb.. Of Tusha ditto, uncleaned, 2 to 3s. a lb.; cleaned, from 5 to 7s.

(2). *The fleece of the Dumba sheep of Kabul and Peshawur.*—This is sometimes called " *Kabuli Pashum*." It is used in the manufacture of the finer sorts of chogas, an outer-robe or cloak with sleeves, worn by Affghans and other Mahomedans of the western frontier.

(3.) *Wahab Shâhi*, or *Kirmani Wool*.—The wool of a sheep found in Kirman, a tract of country in the south of Persia, by the Persian Gulf. It is used for the manufacture of a spurious kind of shawl cloth, and for adulterating the texture of Kashmere shawls.

(4). *The hair of a goat common in Cabul and Peshawur*, called *Pat*, from which a texture called *Pattu* is made.

(5). *The woolly hair of the camel.*—From this a coarser kind of choga is made.

(6). *The wool of the country sheep of the Plains.*—Regarding the production of wool in the Hymalayan or Sub-Hymalayan portion of the Punjab, the following is quoted from last year's Revenue Report.—" There can be no doubt that the valleys of the Sutlej, Ravee, Chandrabaga (or Chenab), Namisukh, and other tributaries of the Indus, supply grazing grounds not to be surpassed in richness and suitableness in any part of the world. The population inhabiting them are chiefly pastoral, but owing to sloth and ignorance the wool they produce is but small in quantity, full of dirt, and ill-cared for in every way." The government of the Punjab have made efforts to improve the breed, by the importation of Merino rams, but hitherto with little success. However, a truss of Merino wool produced in Huzara, a hill-district to the north-west of the Punjab, and sent to England in 1860, was there valued at 1s. and 6d. per lb.

Raw Silk.

Almost all the raw silk in the Punjab is produced in Bokhara, but it is not improbable that the submontane districts of the Punjab were formerly silk producing countries, as it is known that in the time of Justinian silk was produced in Sirhind. A series of experiments was made a few years ago by the Government of the Punjab, with a view of ascertaining whether silk-worms could be successfully reared in the plains, but the experiment was a failure, the heat and want of sufficient moist food having rendered the worms nearly unproductive. Mr. Cope, of Umritsur, who originated the experiment, has, however, again tried it with some success.

Raw Tussur silk is produced extensively in the Seonee district, but is not manufactured into cloth there. It is exported to Nagpore, where it is woven into native cloths, called " Tussur Sarees," &c. No further information can be given at present, as the trade is carried on by the Gonds, living in scattered jungles.

Tussur cocoons are found in large quantities in Perulia and Hazareebaugh.

Tussur silk is locally called "*Khosa*," "*Khoseare*." It is the product of the *Saturnia Mylitta*, moth-caterpillar. The cocoons are found in abundance throughout the forest jungles of Cuttack, and for the most part on the larger trees called the "*Asan*" (the *Pentaptera tomentosa*), the *Sal* or *Shorea robusta*, and less frequently on the common Indian plum or "*Barkolee*" tree. The wild cocoons are cellected by the "Sahars" and other poor and half wild castes (whose villages ore often met with in the heart of the jungles), and sold so many for the pice, to the best advantage, but at no fixed rates. Each cocoon being very carefully enclosed within two leaves brought together and made to wrap arouud it, it is almost impossible to discover by mere sight, on which trees cocoons are to be found. This is, therefore, done by observing the dung of the caterpillar under the tree. The eggs of the moth are also collected and preserved, and the caterpillar regularly reared and tended, in many parts in the hill tracts, on trees pruned and preserved for the purpose. The cocoons vary much in size and colour; and there is also a very perceptible diversity in the texture and glossiness of the raw silk, which most probably depends on the species of tree on which the caterpillar may happen to have fed. The same variety is observable in the female moths, which are of three or four different sizes and colours. The mode of winding off the thread does not differ from that pursued in the case of the ordinary silkworm cocoon proper.

Pigments and Dye Colours.

Lac or Lakhdye is the product of the lac insect. The sample in the Exhibition shows the material from which the dye is extracted, and consists of the wax also, enveloping the twigs round which the insect has formed it. The dye, whether it be the insect itself, or something produced by it, is found under the enveloping wax. This material is collected as far as can be ascertained, from the Asan and " Burkobi trees," by no means uncommon in the jungles. The process by which the dye is extracted is as follows :—

The wax is bruised and boiled, and the colouring matter is thus taken up by the water, which is drained off, and probably to some extent evaporated. The material to be dyed is then dipped in the water, taken out dried, and again dipped and dried, and so on, till the required colour is obtained. To preserve the dyeing matter for future use and sale, circular wads of cotton are dipped in the coloured liquid, then dried, and the process continued till a high colour is obtained. It is in this shape that the dye is sold in the markets.

This substance is gathered in all the tributary states, and a great deal of it brought down from Sumbulpore. Leather is coloured with this dye. Most of the vegetable dyes, it may suffice to say, are treated much in the same way as the above, with the addition of some astringent.

The *lac* is purified after being collected from the tree. It is dissolved in boiling water, and passed through a cloth and spread to dry. Used for native women's bangles; one seer per rupee.

The *Cæsalpinia Sappan* grows not only in the jungles in a wild state, but is also grown in various localities for the sake of the dye.

The *Soorboolee* (botanical name unknown) producing a fast dye of a golden tinge is extracted from this plant, which is a weed growing on sandy spots along the south coast of Pooree. The dye is not used in the district, as the plant is not found in sufficient abundance. The stems readily yield a colour in water.

Kamla Goondee, also locally known as the " Kat soondra," produces a fast dye, applicable to silks and woollens. It is the bloom of a wild fruit. This fruit is about the size of a pea, and grows in large clusters in bunches, and is common in the interior jungles of the district. The fruit is gathered and put into a basket, and well shaken over a cloth spread beneath. The bloom is thus detached and falls through the loosely woven bottom of the basket on to the cloth, and is thus collected. The dye is a bright, golden colour.

A red dye, called Neepa Tsa-gyee, is used by the Burmese to dye their cloths.

The leaves of the *Ruellia* are boiled in water, when the decoction gives a blue colour to cloth, &c., but inferior to indigo.

Tackwood, called Rinnay, used for dyeing Phoongie (Priests) clothes with yellow orange colour; 5,000 maunds procurable, but more can be had if required. Price—5 Rupees per maund.

The Al root is cultivated at the villages of Kupsa, Muttound, Khunna, &c.: the whole extent of cultivation is only about 400 beegahs. The Humeerpore district is the great producing country for al, probably from there being greater facilities for irrigation than in this district. The plants come to maturity in three years. The roots are then dug up and sorted into three kinds, according to the fineness of the fibres. The fibres are then cut and beaten down well, and then ground to powder, which latter is used for the dye. The proportion of prepared fibre is equal to the raw material. The uses to which it is applied are dyeing a red colour, and as a remedy for tooth-ache, as well as for sprains of horses. The cost of the raw material is Rupees 35 per begah, and eight manuds are generally produced in that area of ground. The cost of the prepared fibre is 1 Rupee per maund. It is transported on carts, horses, and bullocks to Banda and Rajapore for export to other parts of India, and the cost of transport is about 8 annas per maund.

Vegetable green dye is made from the leaves of a shrub growing very luxuriantly at Malda; the leaves yield the dye copiously, which readily attaches itself to cloth, flannel, silk, &c. *Directions.*—Dip a bit of cloth into the dye when perfectly dry; pass it quickly through a bath of diluted sulphuric acid; immediately after, into a strong solution of soda, when it will become a permanent green, effectually resisting the action of soap and water. Passing the cloth through the diluted sulphuric acid bath instantly changes it to a pink; soda sends it back to green. If a darker colour is required other mordants must be used, zinc acetate of copper, &c., without sulphuric acid.

Leaves of the green dye, when dried in the oven, will keep without deteriorating for any length of time.

Dissolve in water, then dye a bit of cloth in it well; when dry, dip it in a solution of acetate of copper. Cloths have been dyed with it in the following manner :—

1st.—Make the mordant of the diacetate of copper with lime; saturate a bit of cloth well in this.

2nd.—Make a thick solution of the leaves in cold water, rub the cloth with mordant; when dry dip well in this, hang up to dry; if not deep enough, repeat two or three times. If a bit of cloth is boiled in a solution of the leaves of the green dye itself, it becomes a fast colour, soap and water acting as its mordant. The annexed is a bit of cloth boiled in a solution of the leaves, and well washed with soap and water.

Some powder and a cake or two of excellent yellow dye from the petals of a flower giving out the dye largely, and at once attaching itself to cloth permanently, without mordants. It can be had abundantly, and collected with greater facility than safflower. Dissolve and boil in hot water, then dip the cloth or silk into it.

TANNING SUBSTANCES.

Tari, from Chittagong, is the pod of a leguminous plant, which grows abundantly in the Hills, and is useful for tanning.

Oom Tari is the produce of a palm which grows in this district, and is susceptible of the same as an ordinary tari.

Gutteah is another tanning substance. It is a bush that grows on the sides of creeks and rivers, in low ground, which is inundated with the spring tide. It is cut for firewood, and the fishermen and shoe-makers purchase it, and take the bark off to lay their fishing nets and leather, and afterwards sell the wood posts for firewood.

Terminalia Belerica, "Bahara," *Terminalia Chebula*, "Harida," and *Phyllanthus Emblica*, "Ola," are the fruit of wild trees very common in the jungles; they all yield an astringent juice. In native medical works they are conjointly referred to as the triphul or three fruit, and prescribed whenever an astringent is or is supposed to be indicated. The principal use, however, of this fruit, is in connection with the preparation of leather, in tanning, and blackening processes. *Terminalia Chebula* and the bark of the *Cassia Fistula* are used in the preparation, which is applied to ordinary hides, after they have been taken out of the lime bath.

The bark of the *Cassia Fistula*, locally *Soona Rea Chali*, is used in tanning leather. The tree is abundant in the jungles of the Tributary Mehals.

Terminalia Augustifolia, Acacia Arabica, Quercus Infectoria, Nyctanthes Arbortristis, and *Acacia Catechu*, are substances used by native tanners in Calcutta.

BRITISH ASSOCIATION, CAMBRIDGE.

MONDAY, OCTOBER 6, 1862.

ON MACHINERY FOR COMPOSING AND DISTRIBUTING TYPE.

The following paper, by Charles Hart, was read in Section G:—

The composition of type consists in arranging the different characters in words with proper "spaces" between them, and again in arranging the words so formed in lines of any required length. The latter part of the process is technically called "justifying."

After the type has been used in the press, it becomes necessary that each character, or "sort," should be restored to its proper position in the "case," and when undergoing this process, the types are said to be "distributed."

This branch of industry is one of the very few in which the ingenuity of man has hitherto failed to effect any economy, unless attempts which have been very recently made to accomplish that desirable end shall prove successful. At this day, as in the days of Guttenberg and Caxton, the composition is effected by picking the types with the fingers out of the "case," and the distribution is accomplished by reversing that primitive operation.

But human ingenuity, if hitherto unsuccessful, has not been entirely idle in this matter. The International Exhibition contains no less than three machines, or rather sets of machines, for composing and distributing. They are known as the machines of Young, of Delcambre, and of Mitchel.

The last-named machines have not only been rewarded with a medal at the International Exhibition, but have been adopted by several printers in England, Scotland, and America. They may, therefore, be considered to have established some claim to the notice of those who re specially interested in the diffusion of knowledge.

The composing machine is in shape a right-angled triangle, placed horizontally. There is a key-board at one of the sides, and parallel with, and close to this key-board, there is a small iron shaft, set in motion by steam power, causing a number of parallel bands of tape to move uniformly away from the key-board, and in a direction perpendicular to it. The several characters, or "sorts," are placed in brass slides, which are ranged in a line commencing at the right of the operator (who faces the key-board), and running across the triangle until it almost bisects the other side. In addition to the parallel bands above-mentioned, which all move with uniform velocity, there is another band, called the "main band," running along the hypothenuse of the triangle, which is greater in length than any of the others, and also moves with greater velocity. Under each of these slides one of the parallel bands is constantly kept moving, ready to convey its proper type to the main band; and, on its arrival there, the type falls into its proper place in the word. The duty of the main band is to carry the words thus formed on to a wheel which places the type standing upright, and pushes forward the line as fast as it is formed.

One of the principal difficulties which inventors have to contend against in dealing with this subject, was to find some means by which the types could be made to arrive at their destination in the exact order in which they are struck out by the keys. Mr. Mitchel has achieved this result by causing the several types to move with a speed proportioned to the distance over which they have to travel.

To understand this, it would be necessary to confine our attention to the triangle formed by the line of the slides in which the types rest, the lowest and longest of the parallel bands, and the main band. The side of this triangle, formed by the main band, is about 2½ times as long as the side formed by the parallel band. The main band moves at a speed 2½ times as great as the parallel bands. It follows necessarily that if two types are struck out at the same moment from the opposite ends of the line of slides, both must arrive together at the point of junction of the two bands, one being carried over a space 2½ times as great as the other, and at a speed 2½ times as great. By this very simple contrivance the types are made to arrive infallibly in the order in which they are struck out, however rapid may be the touch of the operator.

The machine has accomplished its duty when the types have been received from the main band by the "setting wheel," which turns each letter into a vertical position and, at the same time, pushes forward the line. The long line thus formed is transferred to a justifying stand, and, when this is filled, the operator proceeds to "justify," leaving another workman to take his turn at the keys. One composing machine, thus worked by two operators, is capable of setting up 50,000 "ens" of corrected matter, being about the ordinary work of four men.

The distributing machine exhibits even greater ingenuity than its companion. When one considers the great variety of "sorts" to be dealt with, amounting to about one hundred and twenty in all, and, further, their great diversity in thickness, it is difficult to conceive that, by a merely mechanical process, each type can be separated from the line in which it is placed, and carried to a receptacle in which it finds no type save one of its own kind.

I have indicated two difficulties, one arising from the diversity of thickness in the types, the other from the variety of sorts. The first is encountered in the separation of each type from the line, the second in conveying each type to its appropriate receptacle.

As an example of the first, let us suppose the word "*mill*" presents itself to the vibrating piece of steel which separates the letters. The first letter, *m*, equals in thickness the three following letters, *ill*, taken together. It becomes necessary in this case to prevent the machine from mistaking those three letters for one, and so cutting them off all at one stroke.

This is effected by means of a nick inserted in the side or edge of the thick type, into which a small bevelled stopper fits, allowing the type to advance further than it could without such nick. The following letter, *i*, having no such nick, is not permitted to advance so far, and so is cut off singly, the letter *l*, which comes next, not being allowed to come within the range of the vibrating cutter, and so on.

In this way, at the first stage of the process, the machine is able to discriminate between the thick and the thin sorts, taking from the line one type at a time and no more.

The nick above mentioned is confined to the thicker sorts of type, and may be called the "separating nick," to distinguish it from those other nicks which are made in the types for the purpose of determining the receptacles to which they are to be severally conveyed. For this latter purpose each type is furnished with one or two nicks, according to the class to which it belongs. There are four classes; the first having only one nick, the other three classes two nicks.

When the type has been separated from the line in the manner above described, it falls upon a brass grooved wheel, whose periphery slopes like the side of a cone. The type, dropping into one of the grooves, becomes suspended by means of its nick on a pin placed at the bottom of the groove, the ends of the type projecting below the under surface of the wheel at distances varying according to the position of the nick. At corresponding distances under the wheel there are small stationary pieces of steel which meet the projecting end of the type as it is carried down, raise it off the pin, and allow it to drop into its proper receptacle. A number of small pushers, worked by an eccentric within the wheel, push forward the type as they fall, and the several characters are thus placed in lines, each "sort" or character by itself, ready to be transferred to the slides of the composing machine.

The keys of the composing machine deal only with about forty "sorts," and so far it would seem to be imperfect. But in answer to this objection it is alleged that the sorts not worked by the keys are comparatively so rarely used that in an average page of printed matter they will not amount to five per cent. of the entire. Those sorts, namely, capital letters, italics, and numbers, are picked up by the operator from a case lying before him on the machine, and dropped into a slide, by which they are conveyed on to one of the belts, and are so carried on and set up by the machine in their proper place and order.

In addition to the saving of labour effected by these machines, it is alleged that the wear of type is diminished by their use, that a complete mastery of the machine can be acquired by a smart boy or girl in the course of a few months; and, finally, that it substitutes an occupation, light, diversified, and easily acquired, for one which is peculiarly laborious and unhealthy, and to the acquisition of which a period of five or seven years is usually devoted.

ARTIFICIAL STONES.

The following is a more detailed and a corrected account of the experiments referred to at the conclusion of the paper on this subject which appeared in last week's *Journal*:—

The transverse strength was tested in the following manner:—

	lbs.
A parallel bar of "Ransome's Concrete Stone," measuring 4 inches × 4 inches, and resting upon iron frames, so as to bear 1 inch on the iron at each end, with 16 inches clear between the supports, sustained a weight suspended from the centre of	2,122
Whilst a bar of Portland stone of the same dimensions, and treated similarly, broke with...	759½

The Adhesive power was proved upon pieces of stone notched for the purpose; the sectional area of which at the weakest part was 5¼ inches.

The specimen of Ransome's Concrete Stone sustained..	1,980
Whilst Portland stone, of same dimensions, and treated similarly..............................broke at	1,104
Bath ditto ditto ditto	796
Caen ditto ditto ditto	768

A 4 inch cube of Ransome's Concrete Stone was found to sustain a weight of 30 tons before it was crushed.

ASSOCIATION FOR THE PREVENTION OF STEAM BOILER EXPLOSIONS, MANCHESTER.

The engineer's monthly report, made Tuesday, September 30th, 1862, states as follows:—

"I am happy to be able again to report that no explosion has happened during the past month to any boiler under the inspection of this Association, neither has the occurrence of any in other quarters come to my knowledge.

"During the past month there have been examined 263 engines and 451 boilers. Of the latter 15 have been examined specially, 6 internally, 72 thoroughly, and 358 externally; in addition to which 4 of these boilers have been tested by hydraulic pressure. The following defects have been found in the boilers examined:—Fracture, 8 (1 dangerous); corrosion, 49 (8 dangerous); safety-valves out of order, 3; water gauges ditto, 14; pressure gauges ditto, 4; feed apparatus ditto, 3; blow-off cocks ditto, 16 (1 dangerous); fusible plugs ditto, 5; deficiency of water, 1; blistered plates, 3 (1 dangerous). Total, 106 (11 dangerous). Boilers without glass water gauges, 5; without blow-off cocks, 17; without back pressure valves, 25.

"Two boilers have recently been met with, neither of which was fitted with its own separate safety-valve, but both were dependent on a single one placed upon the steam pipe, the communication between which and each boiler was conditional on its junction valve being open, so that had the attendant at any time inadvertently left this valve screwed down—on getting up steam for instance on a change of boilers—the whole steam pressure must have been bottled up without chance of escape.

"Feed Back Pressure Valves.—Some of our members do not appear to be fully aware of the importance of fixing a feed back-pressure valve to each of their boilers, and therefore the following instance, lately met with, of the inconvenience arising from the want of them, may be given.

"Four boilers, set side by side and connected together, were working under their ordinary circumstances, when one of them vomited its water through the feed pipe into the adjoining one, draining itself and over-charging the other. The danger of this, if not immediately detected, with a fire in active operation, will at once be seen. It is, however, by no means an uncommon occurrence where back-pressure valves are omitted, especially where any thickening matter exists in the water, which tends to lift it and cause priming, under which circumstances the water has been found to rush backwards and forwards alternately between boilers working in connection. The back-pressure valve prevents this: the water from the feed pump operating underneath and raising it, while the pressure from the boiler operates on the top and closes it. Necessary as these valves are to the safety of boilers when working in a series, they should not be neglected in the case of those working singly, not only when fed by a pump, but also when fed direct from the waterworks main: in the first case, in order that the pump-valves may be accessible when steam is up, and in the second, that the reflux of hot water from the boiler may be prevented either on the bursting of the pipe or other cause. These valves should be placed immediately upon the shell of the boiler, and not at a distance from it, as is sometimes the case, since scalding might ensue should any joints break in the intervening length of pipe, while repair could not be effected without letting the pressure down. For the same reason the feed-stop valve should not be interposed, which it too frequently is, between the back-pressure valve and the boiler, since a disarrangement of the stop valve may entail an entire stoppage, which, had the feed back-pressure valve been placed immediately upon the shell, could easily be rectified with steam up.

"In the construction of this valve care should be taken to limit its rise, for want of which simple precaution some of them have proved to be entirely useless, the water passing freely from one boiler to the other as if the valve were not there. Its most convenient position is at the front end plate of the boiler, nearly on a level with the furnace crown. Its beat can then be heard at every stroke of the engine, and if a screwed spindle be added, so as to convert it into a combined feed-stop and back-pressure valve, which is the best arrangement, then the feed can be regulated without leaving the furnaces.

"BLOW-OUT APPARATUS.—A case of scalding has lately occurred in consequence of the failure of the blow-out apparatus of a boiler which was, however, not under the inspection of this Association.

"The manner in which blow-out taps are often strained with long levers in opening and closing, renders it a matter of surprise that fracture does not more frequently occur, and many have such inefficient arrangements for carrying off the waste water that it beats back with so much violence on the taps being opened, that their use is quite dangerous. Enginemen are in this way but too frequently scalded severely, and our own Inspectors sometimes meet with narrow escapes. Some taps are so inconveniently placed that the nut at the bottom of the plug is quite inaccessible, and thus becomes neglected, in consequence of which several cases have occurred of the plug being shot out by the force of the steam on being opened. Taps fitted with glands are safer as well as more convenient; they should, however, be made entirely of brass in the shell as well as in the plug, and be fitted with a suitable waste pipe. Those made of cast-iron in the shell and brass in the plug are generally found to be inconvenient, and sometimes dangerous, on account of the unequal expansion of the two metals, from which it is frequently impossible to close them, when the boiler becomes robbed of its water, and the fires have to be drawn to prevent injury to the furnaces.

"The case in question, however, was somewhat peculiar, and the fracture did not arise from either of the above causes. The blow-out tap was attached to the boiler by a cast-iron elbow pipe, and this pipe broke short off without warning, while the boiler was at its regular work and the blow-out tap not being touched.

"The cause of this appeared to be as follows:—Boilers, as has been previously stated in these reports, are too frequently considered to be in a state of rest when once set upon their brickwork bed; whereas, from the constant changes of temperature, and the consequent contraction and expansion that take place, not only in the boiler itself, but also in the brickwork, the whole is in a continual state of movement. It appears most probable that this action had in process of time induced a slight settlement of the boiler, and thus that a strain was brought upon the cast-iron elbow pipe, which being bound by the brickwork, consequently gave way. A torrent of hot water naturally ensued, which, unable to escape at the usual outlet, found its way into an adjoining building, where it partially flooded one of the floors, and two or three persons became scalded in consequence.

"PREVENTION OF INCRUSTATION.—It may be stated in brief that the scum pipes for surface blowing out, which have been recommended from time to time, for the prevention of incrustation in boilers, have now been adopted by several of the members, and have, for some time since, been in very successful operation. An early opportunity will shortly be taken of making more detailed reference to this subject; but, in the mean time, it may be stated that a drawing of the arrangement adopted lies at the office for the inspection of the members, and that full particulars, both of the details of construction and results of working, will be given on application.

"HINTS TO MEMBERS ON LAYING DOWN NEW BOILERS.—There is one branch of the service this Association affords which the members do not avail themselves of as fully as they might—namely, that of consulting the records at the office before laying down new boilers or making alterations. Full particulars are kept, not only of the construction of the boilers under inspection, but also of the results of their working; and a consultation of these would frequently save unnecessary outlay, prevent failures of one being repeated by others, and place at the command of each member the experience acquired by the inspection of the whole number of boilers under the charge of the Association."

Home Correspondence.

PATENT LAWS.

SIR,—Will you allow me to call attention, through the *Journal of the Society of Arts*, to the following article from the *Penny Newsman*, presenting an example of considerable importance on the principle of the patent laws, in which the readers of the *Journal* are extensively interested. To the observations of the writer of the article in support of the principle of the protection of the labour of invention, whether by copyrights for designs, or by copyrights for books, — I would add in excuse for the neglect of men of genius and their families by society, that society has not time to attend to the multifarious claims of men of genius, or means to judge of them, or to apportion rewards, or to judge upon conflicting claims. Well devised copyrights and well adjusted patent rights, however rudely, are self-acting, so to speak,—in the apportionment of reward to the inventors, levying that reward as payment from those who benefit directly from the labour,—the consumers.

The case of Crompton is that of a class of men qualified to invent, but not to work inventions commercially. This case is met by commercial men of a new class, who turn inventions to account as a separate division of labour.

I am, &c.,—A MEMBER.

THE CROMPTON STATUE.

See nations, slowly wise and meanly just,
To *buried* merit raise the tardy bust.

"A few conscientious men at Bolton have raised a monument to Samuel Crompton, a native to whose inventions the town largely owes its prosperity, and, from that prosperity, many of the natives their existence. The history of Crompton, and his work, are interesting in a point of view in which they have not hitherto been regarded—viz., that of leaving the labour of invention and mechanical genius so to be rewarded by a sense of gratitude arising from a conscientious recognition of its value from those who are left free to avail themselves of the results of that labour; or of giving him who performs the labour of invention the exclusive right, for a term of years, to its product, under the patent law. Crompton was mainly dependent on the principle of the free use of his labour of invention by others, of a public recognition of its value, and the conscientiousness of those who used it; and his life was one of penury, almost a source of mendicancy and pauperism. Richard Arkwright was sharper, secured his labour of inventing—or of borrowing—by patent rights, fought for it, made those who used it pay for it, secured a princely fortune for himself, and left his family high positions of wealth and aristocratic influence—founded a great family, in short. So it was with Watt. We cannot discover that manufacturers or the nation were any the worse, or prospered the less (even against foreign competitors who were free to use the invention), by the self-acting method of payment secured by patent laws, rough and imperfect though it be. The fate of the families of the unprotected labourers in invention is also suggestive on the other side, and is by no means creditable to our social sympathies. In France Crompton would have received first-class decorations, and, on proof of his poverty, provision as a right for himself; he would have been made a knight of the Legion of Honour, and as such his children would have been "the children of the country," for whose maintenance and education, whether male or female, first-class institutions are provided. The Order of the Bath, for distinguished civil as well as military service, is the order which in England is analogous to the Legion of Honour. The order comprises men of large families and very slender means, but there is no care, or provision, or privilege of the kind for their children. There were collateral descendants of Shakespeare and direct descendants of Milton in obscure poverty, as well qualified for distinctions as the descendants of peers; but they were never thought about, except by one or two solitary curious men. In this very instance of the inauguration of the statue of Crompton (who died only in 1827, in the very neighbourhood and town enriched by his labours), little thought appears to have been bestowed on the condition of his family, or on their claims to any position in the ceremonial. The *Manchester Guardian* states that "the fund for the erection of the statue which was inaugurated yesterday was obtained by subscription, and amounted to about £2,000. Yet, will it be believed, while this tardy recognition is being made of a national benefactor who was permitted to die in indigence, while mayors and wealthy cotton spinners ride in procession and talk of honouring themselves by honouring Crompton, who was the instrument of their fortunes, Crompton's surviving son, his grandchildren, and great-grandchildren were entirely uncared for by the committee of management and the corporate authorities? Mr. John Crompton, the youngest son of the inventor of the mule, was indebted to the kindness of a friend for a suit of clothes in which to be present at the inauguration. He was not invited to any of the festivities, nor were any of the inventor's descendants, of whom Dr. Crompton, of Cavendish-square, Manchester, is one (a grandson). Crompton's descendants number about half a dozen grandchildren and a dozen great-grandchildren, all of whom, with the single exception mentioned, are in poverty, or only a grade above it. The kindness of a gentleman in no way connected with the inauguration proceedings alone enabled them to celebrate the day by a better meal than usually falls to their lot. Where can we find a more glaring instance of popular ingratitude and of painful contrast than here—the memory of a poor deceased benefactor honoured, and his children neglected, if not despised?"

Has the cynic too truly summed up the wisdom of experience when he declared "money to be your only friend?" Must genius depend for its reward not upon the gratitude of mankind, but the firm grip of the law? The fate of this measureless benefactor of the human race, whose worth to England has been priceless, is at once a warning and a reproof. It demonstrates not merely the beneficence, but the necessity, of a legal protection to inventors for the fruits of their brain sweat. It proves that whether in arts, in letters, or in machinery, the public service itself is promoted by securing to the creative mind the exclusive temporary right to the first fruits of blessings it has called into being. Had Crompton been a patentee, the country would have been not less rich, and he a great deal richer. The neglect, the poverty, the obscurity, in the cold shade of which his life withered and lingered, are a scandal to the people who even now do but tardy justice to the memory of that gifted man, who lived to

> 'Read his history in a nation's eyes,'

but never to gild it by its gratitude."

Proceedings of Institutions.

City of London College.—A public meeting was held at this College on Thursday evening, the 9th Oct., for the annual distribution of prizes and certificates to the students. Mr. Alderman W. A. Rose (Lord Mayor-Elect) was announced to take the chair, but he would have committed a breach of civic etiquette had he done so, and, therefore, he was reluctantly obliged to forego that pleasure. The Rev. Charles Mackenzie, M.A., took his place, and said he deeply regretted the absence of Mr. Alderman Rose, who was not only a staunch friend to the College, and had stood up in the Common Council-chamber to support its claim to a grant, but was the very first to give his guinea annually towards its support. The present Lord Mayor, too, was entitled to their respect and gratitude, for he, when the College was in difficulties, cheerfully granted the Egyptian Hall for a public meeting in its behalf, and consented to act as treasurer to a fund designed to place it on a permanent foundation. After some further remarks upon the success of the college students, the nature and value of their studies, and the severity and fairness of the examinations both of the Society of Arts and the City of London College, the Chairman called upon the Rev. R. Whittington, M.A., the Principal of the College, to call up the young men to receive the prizes and certificates which had been awarded to them. The list of those awarded by the Society of Arts has already appeared in the *Journal.* The following is a list of Prizes and Certificates awarded by the City of London College:—Associate—Mr. T. Brodribb, E. G. Clarke, T. R. Howard, Warington, W. Vaughan. Scholarship—J. H. Levy, with 1st Class Certificate Arithmetic, 1st do. do., Geometry, 3rd do. do., Book-keeping, 3rd do. do., Algebra. Lowth Prize—William Vaughan, with 1st Prize and 1st Class Certificate Mathematics, 2nd do. do., Book-keeping. Commercial Prize—H. L. Hughes, with 2nd Prize and 1st Class Certificate German, 1st do. do., French, 2nd do. do., Arithmetic, 2nd do. do., Book-keeping. English Essay Prize—J. Macrae. Principal's Prize—J. Macrae. Arithmetic, 1st Prize, Book-keeping, 1st Prize—W. G. Masham. Chemistry, 1st Prize—W. Meadows, with 3rd Class French. Drawing, 1st Prize—J. Appleton. German, 1st Prize—H. Hempleman, with 3rd Class Book-keeping. First Class Certificates:—Arithmetic—T. J. Lloyd, A. B. Clementson (with 3rd Class Algebra). Algebra—H. Hoskins. Book-keeping—H. J. Garside, (with 2nd Class Arithmetic,) R. C. Bennett, A. Day, (with 3rd Class French.) Drawing—G. Foster. French, with honourable mention—J. S. Harding, (with 3rd Class Arithmetic). French—G. Dickenson. German—F. Bailey. Second Class Certificates:—Arithmetic—J. Brady, W. D. Ground (with 2nd Class Divinity and 2nd ditto English History), G. J. Stancliff, R. G. Webster (with 3rd Class French and 3rd ditto Mathematics). Book-keeping—R. G. Allardice, H. G. Crews, C. W. Webb. Divinity—A. Banister. Drawing—W. H. Gregory. French—C. Dix (with 2nd Class German), J. Pike. German—G. Worley. Greek—D. Harrington. Spanish—H. J. Sudell, W. H. Saunders (with 3rd Class French), J. Vickers. Hebrew—J. S. Stephens.—Third Class Certificates:—Algebra—C. M. Bayfield (with 3rd Class French). Arithmetic—A. Banister, H. G. Clarke, W. R. Clark (with 3rd Class French), C. Law. Book-keeping—J. S. Foster, J. J. Sones. French—T. G. Goalen (with 3rd Class German), J. Lewis. Geometry—L. A. Holderness. Latin—J. Cannon, R. G. Nash. Spanish—R. J. Lesslie. The scholarship won by Mr. Levy entitles him to £10, and a free admission to the college. His claim to these distinctions was established by obtaining the highest number of marks in the subjects taught in the college. It It was stated that, among the eighty-two institutions that sent up candidates to the Society of Arts, the City of London was only beaten by one institution. The

Rev. W. WINDLE proposed, and Mr. E. CLARKE seconded, a vote of thanks to the Society of Arts. Mr. WINKWORTH said that on the part of the Council of the Society of Arts, of which he was now the oldest member except their venerable President, Mr. William Tooke, he was sure they would feel as much gratified as he was at finding that the system of Examinations they had originally inaugurated, and for which they were mainly indebted to his respected collegue, Mr. Harry Chester, had produced such excellent fruit, and was so highly appreciated by the students. The Crosby Hall Evening Classes, now the City of London College, had in former years largely availed themselves of these Examinations, and had carried off a considerable number of prizes and certificates, and on the present occasion he was delighted to see so large a number of students who came up to receive the prizes and certificates which were offered for competition by the Society of Arts and by the College. Nor was he by any means surprised that they were principally given for proficiency in those branches of education which were most useful to young men qualifying themselves for mercantile appointments. It was just what ought to be the case in this great emporium of commerce, where a knowledge of arithmetic, book-keeping, as well as of French, German, and other European languages, was so essential. Of the importance of the last-named subjects the International Exhibition afforded abundant evidence, for much inconvenience was experienced at stalls where English attendants were unable to explain to foreign visitors, who had business views in their inquiries, the peculiar merits of the goods or articles of taste they had in charge. And the same difficulty existed in the foreign departments, where the attendants could not speak English. On the whole, then, the results of the examinations since the establishment of the college were highly satisfactory and encouraging to the principal and lecturers, and most creditable to the students themselves. On the part of the Society of Arts, he begged to thank the meeting for the vote he had risen to acknowledge. The Rev. R. WHITTINGTON, Principal, proposed a vote of thanks to the hon. examiners of the college, which was seconded by Mr. W. VAUGHAN, and acknowledged by Professor CASSAL, of University College. A vote of thanks to the Lecturers and Professors was then proposed by Mr. C. W. PRICE, V.P., seconded by Mr. J. H. LEVY, and responded to by Mr. P. L. SIMMONDS, F.R.S., and Mr. F. REYNOLDS. Mr. MONTAGUE GORE, V.P., then moved, and the Rev. M. W. LUSIGNAN seconded a vote of thanks to the Chairman, which was put to the meeting by the Rev. J. MASKELL, Hon. Sec., and carried unanimously. The proceedings then terminated.

PATENT LAW AMENDMENT ACT.

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APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette, October 3rd*, 1862.]

Dated 19th September, 1862.

2598. J. Smith and W. Smith, Collyhurst, near Manchester—An improved combination of machinery or apparatus for doubling, measuring, and plaiting woven fabrics.

2570. D. C. Bridge and J. Dyson, Halifax—Imp. in the formation of boilers to be employed for warming buildings and similar purposes.

2572. F. Savage, Lynn—Imp. in traction engines.

2576. C. Chinnock, Queen's-road-west, Regent's-park—Imp. in the construction of corkscrews.

2578. E. Feis, 8, Sise-lane—Imp. in the construction of locks, catches, or fastenings for purses, bags, or other receptacles. (A com.)

Dated 20th September, 1862.

2580. H. R. Fanshawe, 3, Leadenhall-street—Imp. in the mode and means used in fishing in seas, rivers, and other waters.

2584. A. Prince, 4, Trafalgar-square—Imp. in steam boiler and other furnaces, and in apparatus for feeding the same. (A com.)

Dated 22nd September, 1862.

2586. J. Sanderson, Clerkenwell—Imp. in writing desks and cases.

2590. M. Vogl, Sambrook-court, Basinghall-street—Imp. in fastenings for leggings and other articles of wearing apparel.

[*From Gazette, October 10th*, 1862.]

Dated 12th July, 1862.

2012. D. Bateman, Low Moor, near Bradford—Imp. in the manufacture of "card cloth" used for carding wool and other fibrous substances.

Dated 28th July, 1862.

2127. J. Walton, 335, Strand, and J. Moore, 11, Upper Berkeley-street, Portman-square—Imp. in the mode of ventilating and heating rooms, Turkish baths, hothouses, and buildings of all kinds.

Dated 11th September, 1862.

2503. L. C. Hoyau, Paris—An improved portable apparatus for marking time.

Dated 15th September, 1862.

2531. J. Pender, Manchester—Imp. in hoops for fastening bales, and in machinery or apparatus for making the same.

Dated 16th September, 1862.

2540. G. L. Lee, Holborn-hill—Imp. in the manufacture of metallic shutters for shop fronts, doors, and windows.

Dated 17th September, 1862.

2548. S. C. Keeler, 29, Percy-street, Tottenham-court-road—Imp. in veneer cutting machinery. (A com.)

2554. G. Haseltine, 100, Fleet-street—Imp. in apparatus for the manufacture of gas from petroleum oil and water, and from cannel coals, bituminous coals, schists, tar, crude coal oil, or other hydro carbons and water. (A com.)

Dated 18th September, 1862.

2557. P. H. Whitehead, Rawtenstall—An improved support or stand for casks, barrels, or other similar vessels.

2559. W. Todd and J. Todd, Heywood, Lancashire—Imp. in machinery or apparatus for collecting waste or fly from spinning machinery, whether for cotton or any other fibrous material.

2561. G. S. Moore, Sunderland—Imp. in ship building.

Dated 19th September, 1862.

2563. T. Watts, Carisbrooke, Isle of Wight—Imp. in combined thrashing machines.

2565. W. Glass, 37, Princes-street, Stamford-street, Lambeth—Imp. in the treatment of sulphuret of antimony, and in obtaining products therefrom.

2566. E. de la Bastida, 43, Hart-street, Bloomsbury-square—An improved cover for chimneys, adapted to prevent them from smoking, and to facilitate the extinguishing of fires therein. (A com.)

2569. J. Bouvet, La Rochelle, France—An improved mode of closing or sealing tin preserve boxes.

2573. W. M. Cochrane, Clattern-cottage, Kingston-on-Thames—Imp. in securing the bolts and nuts of railway fish plates.

2575. R. R. Jackson and J. Coupe, Blackburn—Imp. in looms for weaving.

2577. G. Maw, Benthall Works, near Broseley, Shropshire—Imp. in the manufacture of tesseræ and other mosaic inlays.

Dated 20th September, 1862.

2579. P. L. Forestier, Paris—Imp. in photographic albums.

2582. L. Dixey, 21, King's-road, Brighton, and G. Smith, Angmering, Sussex—A new or improved method of tinting, by lithographic printing, photographic portraits and back grounds, and embossing the same.

2583. J. Wilson, North Brixton, Surrey—An improved composition for preventing and removing incrustations in boilers.

Dated 22nd September, 1862.

2585. C. Mertens, Jubilee-place, Chelsea—Imp. in machinery or apparatus for scutching and dressing flax, hemp, or other fibrous materials.

2589. W. M. Cranston, 58, King William-street—Imp. in machinery for reaping and mowing corn and other crops.

Dated 23rd September, 1862.

2592. R. Fairburn, Burley, near Otley, Yorkshire—Imp. in machinery for combing wool or other fibrous substances.

2593. T. Knowles, J. Houghton, W. Knowles, and W. Houghton, Gomersal, Yorkshire—Imp. in looms for weaving.

2594. C. Pontifex, 154, St. Paul's-road, Canonbury—Imp. in means or apparatus for removing or expressing beer from yeast or from hops.

2595. W. Dobson, Nottingham—A new method of producing various colours on lace or other fabrics.

2596. J. J. N. Micas, of Chateau de By, France—An improved railway brake.

2597. R. A. Brooman, 166, Fleet-street—Imp. in lighting apparatus. (A com.)

2598. R. A. Brooman, 166, Fleet-street—Imp. in photographic apparatus. (A com.)

2599. S. H. Laurent, 29, Boulevart St. Martin, Paris—An improved railway brake.

Dated 24th September, 1862.

2601. J. Farran, Manchester-road, Bolton-le-Moors, Lancashire—Certain imp. in looms for weaving.

2603. W. Taylor, Chester—Imp. in blacking or polish.
2604. R. A. Brooman, 166, Fleet-street—An improved composition for painting. (A com.)
2605. W. Maddick, jun., Liverpool—An improved process or method of treating and preparing madder for dyeing purposes.
2606. D. Posener and A. Posener, Rupert-street, Haymarket—Imp. in the manufacture of inda-rubber add other tobacc pouches or purses.
2607. R. R. Jackson and Æ. I. Jackson, Blackburn—Imp. in the preparation and treatment of flax and other fibrous materials to be subsequently operated upon by machinery employed for preparing and spinning cotton.
2608. R. R. Jackson and Æ. I. Jackson, Blackburn—Imp. in machinery for cutting fibrous and other materials.
2609. W. Upfill and W. Asbury, Birmingham—Imp. in the manufacture of metallic bedsteads, part of which imp. are also applicable for ornamenting tubes and curtain and cornice poles.
2610. T. Edwards, Blackheath, Kent—An improved mode of preparing fibrous materials for spinning.

Dated 25th September, 1862.

2613. T. Kennedy, Kilmarnock, Ayr, N.B.—Imp. in taps or valves.
2615. J. Raywood, Sheffield—Certain imp. in the construction of gas apparatus for the prevention of fraud, and for economising the consumption of gas.
2616. J. R. Breach and E. B. Pyesmith, Leeds—An improved machine for reducing or equalising the length of animal or vegetable fibres.
2617. J. Eardley, Woodville, Leicestershire—Imp. in pitch pipes or tuning pipes.
2618. W. Lea, Wolverhampton—Imp. in hinges for French casements.
2619. A. Potter, Birmingham—Imp. in electro-magnetic engines.
2620. P. Wright, Dudley, Worcestershire—Imp. in the manufacture of parallel vices.
2621. J. R. C. Taunton, Birmingham—Imp. in the manufacture of metallic bedsteads, cots, and couches.
2622. E. C. Muntz, Birmingham—An imp. or imps. in the manufacture of axles.
2623. T. R. Harding, Leeds—Imp. in machinery for opening, cleansing, and carding fibrous material.

Dated 26th September, 1862.

2625. J. J. Bates, Birmingham—A new or improved window sash fastener and guard.
2626. E. Dixon, Wolverhampton—Imp. in machinery and furnaces used in the manufacture of welded iron tubes.
2627. C. D. Abel. 20, Southampton buildings, Chancery-lane—A new or improved purifying and preservative lotion for the mouth. (A com.)
2628. J. Milner, R. D. Milner, and F. Hurd, Wakefield—Imp. in apparatus applicable to machines for preparing wool, flax, and other fibrous substances, parts of which are also applicable to machines for other uses.
2630. W. M. Cochrane, Clattern-cottage, Kingston-on-Thames, Surrey—Imp. in securing the bolts and nuts of railway fish plates.

Dated 27th September, 1862.

2631. F. R. Stack, Whetstone—Imp. in escalading apparatus for military purposes.
2632. J. Crosby, Shepley Hall, Audenshaw, near Manchester—Imp. in carding engines.
2633. H. Hutchinson, No. 26, Rue Notre Dame des Victoires, Paris—Imp. in machinery for covering wire with india-rubber and gutta percha, and similar gums and compounds thereof, and for manufacturing tubes and other articles of such gums and compounds. (A com.)

Dated 29th September, 1862.

2635. J. C. P. Bauchard, Nouvion en Thérache, L'Aisne, France—A twice transversal kneading trough.
2636. H. Baum, Elberfield, Prussia—Imp. in the manufacture of moreens and such like fabrics.
2637. J. Brown, Middleton—Certain imp. in carding engines employed for carding cotton and other fibrous substances.
2639. M. Puddefoot, Blisset-street, Greenwich—Imp. in apparatus for tilling land.
2640. W. B. Lord and F. H. Gilburt, Sandgate, Kent—Imp. in loading fire-arms, and in blasting.
2641. W. E. Gedge, 11, Wellington-street, Strand—An improved furnace for casting steel. (A com.)
2643. H. Hirsch, 65, Bridge-road, Lambeth—Imp. in apparatus for showing combinations of colours.
2644. Rev. H. Moule, Fordington Vicarage, Dorchester—Imp. in heating frames and the beds of hot-houses, also in heating hot houses and other buildings used for growing plants, and for other purposes.
2645. H. Ellis, Bangor, North Wales—Imp. in the manufacture of compounds of silica, and in the application of certain compounds of silica to mineralise woven fabrics, paper, and paper pulp, to harden and preserve stone and cement in the production of artificial stone and paint, and in the production and glazing of porcelain and such like manufactures.
2646. J. Bucknall, Boston, Lincolnshire—Imp. in the construction of horse hoes.
2647. Capt. J. Addison, St. Heliers, Jersey—Imp. in moorings or apparatus for securing articles, applicable also to the fixing of chairs for railways.
2648. R. A. Brooman, 166, Fleet-street—Imp. in saddle trees and collars. (A com.)
2649. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in shells for war purposes. (A com.)
2650. W. Carrick and W. Carrick, jun., Carlisle—Imp. in felting apparatus.

Dated 30th September, 1862.

2652. E. J. M. Le Breton, Neuilly-sur-Seine, near Paris—An improved propeller for boats and ships.

Inventions with complete Specifications Filed.

2656. G. Haseltine, 100, Fleet-street—Imp. in the means for and mode of warming and ventilating buildings. (A com.)—1st October, 1862.

Patents Sealed.

[*From Gazette, October 10th*, 1862.]

10th October.

1048. E. Butterworth.
1052. J. Howard, E. T. Bousfield, and T. Phillips.
1053. I. Whitesmith.
1055. N. Nussey.
1058. E. Drewett.
1062. E. Peyton and W. F. Batho.
1063. J. F. Spencer.
1075. R. A. Brooman.
1076. R. A. Brooman.
1080. T. H. Bennett.
1081. F. A. Le Mat and C. F. Girard.
1086. J. Platt and W. Cheetham.
1087. J. Platt & W. Richardson.
1090. T. W. Gray.
1091. F. C. Phillipson.
1096. T. Edwards & J. Harrison.
1097. J. Barbour.
1100. D. Stott.
1110. J. H. Johnson.
1120. W. Harling, J. M. Todd, and T. Harling.
1122. J. Murphy.
1125. J. L. Perin.
1128. R. A. Brooman.
1129. R. A. Brooman.
1132. S. Rideal and R. Shepherd.
1133. W. Clark.
1134. J. C. Rivett and J. M. Hetherington.
1135. R. Wedgwood.
1138. J. S. Phillips.
1145. E. Loysel.
1148. A. N. Wornum.
1150. H. Lumley.
1168. S. S. Putnam.
1171. A. Warner.
1174. R. Boby.
1179. G. H. Birkbeck.
1192. W. Haggett.
1193. H. Wheatley.
1194. J. Bond.
1204. R. Zimara.
1230. W. Clark.
1235. G. Bischof, jun.
1268. G. Davies.
1295. R. Walker.
1333. F. Marrel.
1506. F. E. Sickels.
1529. H. B. Barlow.
1833. J. Anderton.
1874. G. Peterson.
2007. T. Hill.
2230. G. Haseltine.

Patents on which the Stamp Duty of £50 has been Paid.

[*From Gazette, October 14th*, 1862.]

October 6th.

2271. G. A. Smith.
2443. W. Clark.

October 7th.

2331. T. Twells.

October 8th.

2334. W. Prosser.

October 9th.

2320. J. Carrick.
2343. G. Price.

October 10th.

2336. W. Burgess.

October 11th.

2316. J. Skertchly.
2338. T. Vicars, sen., T. Vicars, jun., T. Ashmore, and J. Smith.
2345. J. Jack.
2367. W. E. Newton.

Patents on which the Stamp Duty of £100 has been Paid.

[*From Gazette, October 14th*, 1862.]

October 6th.

2243. W. Rothera.

October 8th.

2317. H. Bessemer.
2319. H. Bessemer.
2321. H. Bessemer.
2325. H. Bessemer.
2327. H. Bessemer.

October 10th.

2309. W. Cotton.

October 11th.

2553. J. Wilkinson, sen., and J. Wilkinson, jun.

LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Name.	Address.
4513	Oct. 1	Label, Card, and Plate Affixer	Richard Sill, jun.	Birmingham.
4514	„ 3	A Locket or other Article of Jewellery ...	Reuben and George Phelps ...	73, Spencer-street, Birmingham.